REMARKS

In the Office Action dated July 11, 2003, the Examiner (1) objected to the drawings under 37 CFR 1.83(a); (2) rejected claims 1-24 under 35 U.S.C. § 112, first paragraph; (3) rejected claims 1-9, 15-20, and 23-24 under 35 U.S.C. § 102(b); and (4) rejected claims 1-10, 15-20, and 23-24 under 35 U.S.C. § 103(a). Applicant has made amendments to Figures 2-3, the specification, and claims 1, 12, 15, 19, 21, and 22. Claims 8 and 20 have been canceled. No new matter has been added.

Applicant submits that that claims 1-7, 9-19, and 21-24 are in condition for allowance. Therefore, Applicant requests that the Examiner enter this amendment and issue a Notice of Allowance.

A. Response to Objection to the Drawings

The drawings were objected to under 37 C.F.R. § 1.83(a) for not showing the structural relationship between the noise source and the drive electronics. Fig. 2 has been amended to show noise 220 being injected into the drive electronics 218. Further, Fig. 3 has been amended to show that the output of the noise source 300 is the noise 220. This amendment is supported in the specification, claims, and abstract as filed. (See e.g., Applicant's specification page 10, lines 5-6; claims 1, 12, 15; Abstract). Accordingly, no new matter has been added. Replacement sheets for Fig. 2 and Fig. 3 are included as part of this response.

B. Response to the 35 U.S.C. § 112, First Paragraph Rejection

Claims 1-24 were rejected under 35 U.S.C. § 112, First Paragraph for failing to comply with the enablement requirement. Specifically, the Office Action states that the specification does not

describe the structural relationship between the noise source and the drive electronics, where the noise is injected, and why the noise helps lock. As described above, Figures 2 and 3 have been amended to show the structural relationship between the noise source and the drive electronics.

The noise source can inject noise into any location of the drive electronics. The drive electronics are any combination of electronic devices capable of providing a drive voltage to the motor combs to cause the proof masses to oscillate. (See e.g., Applicant's Specification page 9, lines 9-11.) The invention is not limited to any particular type of drive electronics, and drive electronics for MEMS gyroscopes are well known in the art. Because the invention is not limited to a type of drive electronics or to the injection point of the noise into the drive electronics, Applicant's specification does enable a person skilled in the art to make and use the invention without undue experimentation. A description of why injecting noise helps lock is described below.

C. Response to the 35 U.S.C. § 102(b) Rejection

Claims 1-9, 15-20, and 23-24 were rejected under 35 U.S.C. § 102(b) as being anticipated by "Effects of Impact and Vibration on the Performance of a Micromachined Tuning Fork Gyroscope" by Robert D. White ("White"). Claims 1 and 15 have been amended to specify that narrowband noise is injected into the drive electronics connected to a MEMS gyroscope.

In claims 1 and 15, Applicant recites injecting narrowband noise into the drive electronics connected to the MEMS gyroscope. The MEMS gyroscope operates at a natural frequency. During startup conditions, the drive electronics must find the particular natural frequency and lock onto that value. Standard electronics are not complex enough to predict the natural frequency. Many present drive electronics rely on broadband noise to start a MEMS gyroscope, such as Johnson noise and Shot noise, which causes the drive electronics to randomly search for the proper natural frequency or

mode. By injecting narrowband noise into the drive electronics, the narrowband noise amplifies the natural frequency. Additionally, the narrowband noise avoids amplifying wrong modes and general background noise. Accordingly, by injecting narrowband noise into the drive electronics the start time of the MEMS gyroscope is improved.

White teaches that random noise in the MEMS gyroscope system will excite the modes to some degree and this motion will allow the MEMS gyroscope to start with no external reference. (White, pages 50-52.) This random noise described by White is broadband noise, which will cause the drive electronics to randomly search for the natural frequency. Additionally, as stated in the Office Action, White does not teach purposely injecting noise into the drive electronics to improve startup. (Office Action, page 4.) Because White does not teach injecting narrowband noise into the drive electronics connected to the MEMS gyroscope, White does not teach each element of claim 1 and 15. Thus, Applicant submits that White does not anticipate claims 1 and 15.

Claims 2-7 and 9 depend from claim 1. Claims 16-19 and 23-24 depend from claim 15. Accordingly, Applicant also submits that White does not anticipate Claims 2-7, 9, 16-19, and 23-24.

D. Response to the 35 U.S.C. § 103(a) Rejection

Claims 1-10, 15-20, and 23-24 were rejected under 35 U.S.C. § 103(a) as being obvious in light of the combination of White and U.S. Patent No. 6,510,737 ("Hobbs"). Hobbs teaches using a square wave as a drive signal to minimize turn-on time. (See e.g., Hobbs, Abstract and column 4, lines 42-45.) Using a square wave as a drive signal causes broadband noise to be injected into the drive electronics. This broadband noise amplifies the wrong modes, which causes the drive electronics to take longer to lock onto the natural frequency. While Johnson noise, Shot noise, and

square wave noise mechanisms may be used to start a MEMS gyroscope, these noise types are not as fast and reliable as injecting narrowband noise. Neither White nor Hobbs teaches injecting narrowband noise into the drive electronics connected to a MEMS gyroscope. Accordingly, Applicant submits that claims 1 and 15 are not obvious in light of the combination of White and Hobbs.

Claims 2-7 and 9-10 depend from claim 1. Claims 16-19 and 23-24 depend from claim 15. Accordingly, Applicant also submits that claims 2-7, 9-10, 16-19, and 23-24 are not obvious in light of the combination of White and Hobbs.

CONCLUSION

In light of the above amendments and remarks, Applicant submits that the present application is in condition for allowance and respectfully requests notice to this effect. The Examiner is requested to contact Applicant's representative below if any questions arise or she may be of assistance to the Examiner.

Respectfully submitted,

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